

**ABSTRACT TO BE SUBMITTED TO THE  
5<sup>TH</sup> IAASS\* CONFERENCE: A SAFER SPACE FOR A SAFER WORLD  
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**Monitoring of Microbial Loads During Long Duration Missions  
as a Risk Reduction Tool**

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Humans have been exploring space for more than 40 years. For all those years microorganisms have accompanied, first un-manned spacecraft/cargo and later manned vessels. Microorganisms are everywhere on Earth, could easily adapt to new environments and/or can rapidly mutate to survive in very harsh conditions. Their presence in spacecraft and cargo have caused a few inconveniences over the years of humans spaceflight, ranging from crew health, life support systems challenges and material degradation. The sterilization of spacecraft that will host humans in long duration mission would be a costly operation that will not provide a long-term solution to the microbial colonization of the vessels. As soon as a human is exposed to the spacecraft, during the mission, microorganisms will start to populate the new environment.

As the human presence in space increases in length, the risk from the microbial load, to hardware and crew will also increase. Mitigation of this risk includes several different strategies that will include minimizing the microbial load (in numbers and diversity) and monitoring. This presentation will provide a list of the risk mitigation strategies that should be implemented during ground processing, and during the mission. It will also discuss the areas that should be discussed before an effective in-flight microbial monitoring regimen is implemented. Microbial monitoring technologies will also be presented.

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\*International Association for the Advancement of Space Safety (IAASS)

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